

WHAT IS CLAIMED:

1. A mass production method for three-dimensional micro structure having high aspect ratio, comprising the steps of:

dividing the three-dimensional micro structure, which is to be manufactured, into prescribed numbers of imaginary layers (step A);

forming a seed layer on a substrate (step B);

forming a photosensitive material coating layer with prescribed thickness on said seed layer through coating photosensitive material (step C);

forming a space for plating through patterning, said space corresponds to the shape of the divided layer of the micro structure which was divided in above step A (step D);

forming a metal layer through filling up said space for plating with plating method (step E);

flattening the upper surface of the said metal layer and the photosensitive material coating layer through grinding (step F);

forming a photosensitive material coating layer with prescribed thickness on said upper surface flattened with grinding in step F, through coating photosensitive material (step H);

forming a metal layers, which correspond to each divided layers in step A, by repeating the above steps from step D to step H, and depositing the formed metal layers (step I); and

removing the substrate, photosensitive material coating and seed layer through etching after step I, and obtaining micro structure (step J).

2. A mass production method for three-dimensional micro structure having high aspect ratio according to claim 1, wherein, the step of forming middle seed layer on said upper surface

flattened with grinding in step F is included between the step F and step H, and said middle seed layer is thinner than said metal layer (step G);

3. A mass production method for three-dimensional micro structure having high aspect ratio according to claim 1, wherein, in step A, the three-dimensional micro structure is divided horizontally.

4. A mass production method for three-dimensional micro structure having high aspect ratio according to claim 1, wherein, in step B, said substrate is made up of single crystal silicon, said seed layer is made up of conductive material, and said seed layer is formed on the substrate through any one method of sputtering, chemical vapor deposition or evaporation.

5. A mass production method for three-dimensional micro structure having high aspect ratio according to claim 1, wherein, in step C and step F, said photosensitive material has large viscosity and the thickness of said photosensitive material coating layer is 200~300 μ m.

6. A mass production method for three-dimensional micro structure having high aspect ratio according to claim 1, wherein, in step D, any one light source of ultraviolet light, X-ray or laser is used.

7. A mass production method for three-dimensional micro structure having high aspect ratio according to claim 1, wherein, in step D of patterning, the amount of light exposed on the boundary area of photosensitive material, which is located between the exposed area and the unexposed area by mask, is regulated so that the side plane of the pattern, which is formed on said photosensitive material coating layer, forms incline plane.

8. A mass production method for three-dimensional micro structure having high aspect ratio according to claim 1, wherein, in step F, the step is performed through lapping or CMP.

9. A mass production method for three-dimensional micro structure having high aspect ratio according to claim 1, wherein, during the repeating process of step I, different kinds of metals are used as depositing metal layers in each plating process of step E.